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Update on the checklist of fish species of the Bolivian Amazon

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Abstract: In 2010 and 2011 new checklists of fish species occurring in the Bolivian Amazon have been published. We add 21 species to these lists of which two are new reports for Bolivia (*Apistogramma urteagai* Kullander, 1986 and *Vandellia sanguinea* Eigenmann, 1917). The other 19 taxa have been reported earlier for the Bolivian Amazon. Their absence on previous checklists indicate the difficulties to compile an overview of the current literature on the fish fauna of the Bolivian Amazon. The ichthyofauna of Bolivia is still not entirely known and many species await formal descriptions. Future collection efforts and taxonomic reviews might rise the number of known Bolivian fish species considerably in the near future.

Introduction

Bolivia is one of the richest countries of the world when measured in its biodiversity (Ibisch and Mérida 2004). This stands in a stark contrast with the poor taxonomic knowledge of the fish species in the Bolivian Amazon. Although this information is crucial for nature conservation and ecological research, there are serious gaps in our knowledge about the occurrence and distribution of fish taxa in this region. Recently, new checklists of fish species of the Bolivian Amazon has been published (Pouilly *et al.* 2010; Carvajal-Vallejos and Zeballos Fernández 2011). However, the authors of these faunal surveys missed a substantial amount of species occurring in the study area, indicating the difficulties to compile an overview on the available literature. In this brief review, we will present a list of additional fish taxa occurring in the Bolivian Amazon.

Materials and Methods

Reports of fish species for the Bolivian Amazon in this study stem from a literature survey including old and German language reports and from re-examinations of fish specimens deposited in the collections of the CIRA-UAB and CBF. Only fish taxa with available names appearing in neither Pouilly *et al.* (2010) nor Carvajal-Vallejos and Zeballos Fernández (2011) are included in this article. Note that these two studies did not consider species from the Andean portion of the Bolivian Amazon River drainage or from the Acre River drainage. Exotic species and taxa not identified at species level (questionable taxonomic status or new species) were not considered in this study.

Material examined: *Apistogramma urteagai*: CBF 00829, 4 specimens, and CBF 00851, 2 specimens, arroyo sin nombre, S. W. San Miguel, 11°40' S, 67°43' W, río Madre de Dios drainage, Pando, Bolivia, Jaime Sarmiento and Soraya Barrera, 09th October 1991.

Vandellia sanguinea: CIRA-UAB 1071, 1 specimen, río Madre de Dios at El Chive, Pando, Bolivia, 28th June 2001.

Abbreviations: CBF (Colección Boliviana de Fauna, La Paz, Bolivia), CIRA-UAB (Centro de Investigación de Recursos Acuáticos - Universidad Autónoma del Beni, Trinidad, Bolivia).

Results and Discussion

Twenty one fish species not listed in neither Pouilly *et al.* (2010) nor Carvajal-Vallejos and Zeballos Fernández (2011) have been found to occur in the Bolivian Amazon (Table 1). Of those 21 species, three are reported as new for Bolivia (*Apistogramma urteagai* Kullander 1986 and *Vandellina sanguinea* Eigenmann 1917) or have been reported very recently (*Hyphessobrycon elachys* Weitzman, 1984; see Hablützel, 2012). *Corydoras mamore* Knaack, 2002, *Apistogramma similis* Staeck 2003 and *A. acrensis* Staeck 2003 have been reported in foreign language aquarium hobbyist literature (Knaack 2003; Staeck 2003; Lahrmann 2010). Six species (*Hyphessobrycon pando* Hein, 2009, *Serrasalmus odyssei* Hubert and Renno, 2010, *Jurengraulis juruensis* (Boulenger, 1898), *Aphyolebias claudiae* Costa, 2003, *Nannoptopoma sternoptychum* Schaefer, 1996 and *Megalonema amaxanthum* Lundberg and Dahdul 2008) have apparently been overlooked by other researchers. The remaining nine species inhabit (sub-) mountainous streams of the Andes at more than 250 m altitude, a region which has not been considered in other recent checklists (Pouilly *et al.* 2010; Carvajal-Vallejos and Zeballos Fernández 2011).

Although only a small fraction of the 21 fish species are new reports for Bolivia, the present brief review on some rarely read literature will further contribute to our knowledge on Bolivian ichthyodiversity and can be regarded as an update on the publications by Pouilly *et al.* (2010) and Carvajal-Vallejos and Zeballos Fernández (2011). Below, we will shortly discuss questionable or new records as well as records published in journals which may be difficult to obtain.

Siluriformes – Trichomycteridae

Vandellia sanguinea Eigenmann 1917 is first reported from Bolivia. The species was identified based on the diagnostic arrangements of odontodes following Eigenmann (1918). Although the identification literature used is quite dated, the geographical proximity to the type locality (Santo Antonio de Madeira in the vicinity of Porto Velho) is consistent with the occurrence of this hematophageous species in the Bolivian Amazon. Especially as their hosts (large pimelodid catfish) can surpass the cataracts of the Madeira River between Porto Velho and Guayaramerín (Goulding 1979). At least three species of *Vandellia* occur in the Bolivian Amazon of which one appears to be new to science (Hablützel unpublished data).

Trichomycterus tiraquae (Fowler 1940) has not been included in the checklist by Carvajal-Vallejos and Zeballos Fernández (2011) because several authors (De Pinna and Wosiacki 2003; Ferraris 2007) considered it as a synonym of *T. rivulatus* Valenciennes 1846 (Carvajal-Vallejos pers. comm.). However, a more recent detailed morphological examination confirmed its species status (Fernández and Miranda 2007).

Perciformes – Cichlidae

Apistogramma acrensis Staeck 2003 has been reported from the vicinity of Cobija (Acre River drainage) by Lahrmann (2010) in a German aquarium hobbyist journal (note that this journal is indexed by the Zoological Record). The morphological characters visible from the accompanying picture showing two adult males and the proximity to the type locality leave few doubt about the accuracy of the species identification. *Apistogramma acrensis* is morphologically quite similar to *A. urteagai* Kullander 1986, a species also included in this paper. *Apistogramma acrensis* can be distinguished from the latter by having the lateral band widened posteriorly, reaching a width of about two scale rows in the posterior portion (vs. width of one scale row along the entire length of the lateral band (Staeck 2003)). Future collection efforts in the Bolivian Acre River drainage will certainly lead to several new reports for Bolivia, as its ichthyofauna is quite distinct from the remaining Bolivian Amazon, which entirely belongs to the upper Madera River drainage.

Specimens of *Apistogramma urteagai* in the collection of the CBF have been identified using the accurate morphological description by Kullander (1986). The collection site is situated in the Madre de Dios River drainage about 250 km downstream of the type locality.

Osteoglossiformes – Osteoglossidae

Arapaima gigas (Schinz 1822) is considered as an exotic species (Sarmiento and Barrera 2004; Hrbek *et al.* 2005; Carvajal-Vallejos *et al.* 2011). Interestingly, when screening old literature concerning the Bolivian ichthyofauna, we found an anecdotal report by Heath (1883), stating that the species is native to the lower course of the río

Table 1. Fish taxa of the Bolivian Amazon not included in neither Pouilly *et al.* (2010) nor Carvajal-Vallejos and Fernández Zeballos (2011) along with information about reference and currently known geographic distribution. + type locality within Bolivian Amazon.

TAXON	REFERENCE	DISTRIBUTION WITHIN THE BOLIVIAN AMAZON
Clupeiformes Engraulidae		
Jurengraulis juruensis (Boulenger, 1898)	Kullander and Ferraris 2003	Mamoré and lower Iténez River drainage
Characiformes Crenuchidae		
Characidium schindleri Zarske and Géry, 2001 +	Zarske and Géry 2001	upper Mamoré River drainage
Characiformes Characidae		
Bryconacidnus hemigrammus Pearson, 1924 +	Pearson 1924	upper Beni River drainage
Hyphessobrycon elachys Weitzman, 1984	Hablützel, 2012	Mamoré river drainage
Hyphessobrycon pando Hein, 2009 +	Hein 2009	Manuripi river drainage
Knodus longus Zarske and Géry, 2006 +	Zarske and Géry 2006	upper Beni River drainage
Knodus shinahota Ferreira and Carvajal, 2007 +	Ferreira and Carvajal 2007	upper Mamoré River drainage
Characiformes Serrasalmidae		
Serrasalmus odyssei Hubert and Renno, 2010 +	Hubert and Renno 2010	widespread in the Bolivian Amazon
Siluriformes Trichomycteridae		
Trichomycterus tiraquae (Fowler, 1940) +	Fowler 1940	upper Mamoré River drainage
Vandellia sanguinea Eigenmann, 1917	CIRA-UAB	Madre de Dios River drainage
Siluriformes Callichthyidae		
Corydoras mamore Knaack, 2002 +	Knaack 2002	Mamoré River drainage
Siluriformes Astroblepidae		
Astroblepus longiceps Pearson, 1924 +	Pearson 1924	upper Beni River drainage
Siluriformes Loricariidae		
Farlowella altocorpus Retzer, 2006 +	Retzer 2006	upper Beni River drainage
Hypostomus levis Pearson, 1924 +	Pearson 1924	upper Beni River drainage
Nannoptopoma sternoptychum Schaefer, 1996	Schaefer 1996	Mamoré and Madre de Dios River drainages
Siluriformes Heptapteridae		
Rhamdella rusbyi Pearson, 1924 +	Pearson 1924	upper Beni River drainage
Siluriformes Pimelodidae		
Megalonema amaxanthum Lundberg and Dahdul, 2008 +	Lundberg and Dahdul 2008	Tahuamanú River drainage
Cyprinodontiformes Rivulidae		
Aphyolebias claudiae Costa, 2003 +	Costa 2003	San Pablo River drainage
Perciformes Cichlidae		
Apistogramma acrensis Staeck, 2003	Lahrmann, 2010	Acre River drainage
Apistogramma similis Staeck, 2003 +	Staeck 2003	Beni and Mamoré River drainages
Apistogramma urteagai Kullander, 1986	CBF	Madre de Dios River drainage

Beni, but extremely rare (allegedly restricted to the lake "Mamorebey"). Although not too much faith should be put in such 19th century statements, *A. gigas* has been well known as an important target species for fisheries at the time and species misidentification may be unlikely because of its unique morphology. However, this anecdotal report does certainly not fulfill today's requirements for biodiversity inventories and genetic analysis (Hrbek *et al.* 2005) as well as population dynamics over the past 30 years (Carvajal-Vallejos *et al.*, 2011) support a recent introduction of *A. gigas* in the Bolivian Amazon.

How many fish species are there in the Bolivian Amazon?

Over the last 25 years, several numbers have been published to answer this question. Starting at 389 (Lauzanne *et al.* 1991), the reported number of species continuously increased to 688 (Chernoff *et al.* 2000) and 973 (Pouilly *et al.* 2010). Whereas the latter two studies uncritically compiled data from the literature, Carvajal-Vallejos and Zeballos Fernández (2011) evaluated the reliability of the available data and combined it with own records. They corrected the estimate by Pouilly *et al.* (2010), which suffered from questionable records and misidentifications, to 714 species. Here, we add 21 other species to the list and many species may still await their discovery. However, several species may still have to be discarded from current lists as misidentifications and future revisions will therefore not necessarily lead to a higher number of reports. Certainly, future checklists should be more critical regarding false reports and every new report should be accompanied by at least a brief list of identification criteria and, if available, a color picture of the examined specimens.

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Literature Cited

Carvajal-Vallejos, F.M. and A.J. Zeballos Fernández. 2011. Diversidad y distribución de los peces de la Amazonía boliviana; p. 101-147 *In* Van Damme P.A., F.M. Carvajal and J. Molina (ed.). *Peces y Delfines de la Amazonía boliviana: Hábitats, potencialidades y amenazas.* Cochabamba: Editorial INIA.

Carvajal-Vallejos, F.M., P.A. Van Damme, L. Cordova and C. Coca. 2011. La introducción de *Arapaima gigas* (paiche) en la Amazonía boliviana; p. 367-396 *In* Van Damme P.A., F.M. Carvajal and J. Molina (ed.). *Peces y Delfines de la Amazonía boliviana: Hábitats, potencialidades y amenazas*. Cochabamba: Editorial INIA.

Chernoff, B., A. Machado Allison, P. Willink, J. Sarmiento, S. Barrera, N. Menezes and H. Ortega. 2000. Fishes of three Bolivian rivers: Diversity, distribution and conservation. *Interciencia* 25(6): 273-283.

Costa, W.J.E.M. 2003. Three new annual fishes of the genus *Aphyolebias* Costa, 1998 (Cyprinodontiformes: Rivulidae) from Bolivian and Peruvian Amazon. *Comunicações do Museu de Ciências e Tecnologia da PUCRS, Série Zoologia* 16(2): 155-166.

De Pinna, M.C.C. and W. Wosiacki. 2003. Family Trichomycteridae (Pencil or parasitic catfishes); p. 270-290 *In* Reis, R.E., S.O. Kullander and C.J. Ferraris Jr. (ed.). *Check List of the Freshwater Fishes of South and Central America*. Porto Alegre: EDIPUCRS.

Eigenmann, C.H. 1918. The Pygiidae, a family of South American catfishes. *Memoirs of the Carnegie Museum* 7(5): 259-398.

Fernandez, L. and G. Miranda. 2007. A catfish of the genus Trichomycterus from a thermal stream in southern South America (Teleostei, Siluriformes, Trichomycteridae), with comments on relationships within the genus. *Journal of Fish Biology* 71(5): 1303-1316.

Ferraris Jr., C.J. 2007. Checklist of catfishes, recent and fossil (Osteichthyes: Siluriformes), and catalogue of siluriform primary types. *Zootaxa* 1418: 1-628.

Ferreira, K.M. and F.M. Carvajal. 2007. *Knodus shinahota* (Characiformes: Characidae) a new species from the río Shinahota, río Chapare basin (Mamoré system), Bolivia. *Neotropical Ichthyology* 5(1): 31-36.

Fowler, H.W. 1940. Zoological results of the second Bolivian expedition for the Academy of Natural Sciences of Philadelphia, 1936-1937. Part I. – The fishes. *Proceedings of the Academy of Natural Sciences of Philadelphia* 92: 43-103.

Goulding, M. 1979. *Ecologia da pesca do rio Madeira*. Manaus: INPA. 172 p. [Portuguese translation of the English original publication]

Hablützel, P.I. (2012). A preliminary survey of the fish fauna in the vicinity of Santa Ana del Yacuma in Bolivia (río Mamoré drainage). *Biota Neotropica* 12(4): 1-10.

Heath, E.R. 1883. Exploration of the River Beni in 1880-1. *Proceedings of the Royal Geographical Society and Monthly Record of Geography, New Monthly Series* 5(6): 327-347.

Hein, G. 2009. *Hyphessobrycon pando* sp. n., a new rosy tetra from northern Bolivia (Teleostei, Characiformes, Characidae). *Bulletin of Fish Biology* 10(1/2): 1-10.

Hrbek, T., I.P. Farias, M. Crossa, I. Sampaio, J.I.R. Porto and A. Meyer. 2005. Population genetic analysis of *Arapaima gigas*, one of the largest freshwater fishes of the Amazon basin: implications for its conservation. *Animal Conservation* 8(3): 297-308.

Hubert, N. and J.F. Renno. 2010. *Evolution of the Neotropical Ichthyofauna – molecular and evolutionary perspectives about the origin of fish communities in the Amazon*. Saarbrücken: Éditions Universitaires Européennes. 95 p.

Ibisch, P.L. and G. Mérida (ed.). 2004. *Biodiversity: the richness of Bolivia. State of knowledge and conservation*. Ministry of Sustainable Development. Santa Cruz de la Sierra: Editorial FAN. 644 p.

Knaack, J. 2003. Ein weiterer neuer Panzerwels aus Bolivien: *Corydoras mamore* n. sp. (Pisces, Siluriformes, Callichthyidae). *VDA-aktuell* 2003(1): 16-24.

Kullander, S.O. 1986. *Cichlid fishes of the Amazon River drainage of Peru*. Stockholm: Swedish Museum of Natural History. 431 p.

Kullander, S.O. and C.J. Ferraris, Jr. 2003. Family Engraulidae (Anchovies); p. 39-42 In Reis, R.E., S.O. Kullander and C.J. Ferraris, Jr. (ed.) *Check list of the freshwater fishes of South and Central America*. Porto Alegre: EDIPUCRS.

Lahrmann, F. 2010. Bolivianische Zwergbuntbarsche in der Natur und im Aquarium (I). *Die Aquarien- und Terrarienzeitschrift* 63(4): 26-30.

Lauzanne, L., G. Loubens and B. Le Guennec. 1991. Liste commentée des poissens de l'Amazonie bolivienne. *Revue d'Hydrobiologie Tropicale* 24(1): 61-76.

Lundberg, J.G. and W.M. Dahdul. 2008. Two new cis-Andean species of the South American catfish genus *Megalonema* allied to trans-Andean *Megalonema xanthum*, with description of a new subgenus (Siluriformes: Pimelodidae). *Neotropical Ichthyology* 6(3): 439-454.

Pearson, N.E. 1924. The fishes of the Eastern slope of the Andes. I. The fishes of the Rio Beni basin, Bolivia, collected by the Mulford expedition. *Indiana University Studies* 11(64): 1-83.

Pouilly, M., M. Jégu, J. Camacho Terrazas, M. Quintilla Palacios, G. Miranda Chumacero, J.P. Zubieta Zubieta and T. Yunoki. 2010. Lista actualizada y distribución de los peces en las tierras bajas de la Amazonía Boliviana. *Revista Boliviana de Ecología y Conservación Ambiental* 28: 73-97.

Retzer, M.E. 2006. A new species of *Farlowella* Eigenmann and Eigenmann (Siluriformes: Loricariidae), a stickcatfish from Bolivia. *Zootaxa* 1282: 59-68.

Sarmiento, J. and S. Barrera. 2004. List of fish species present in Bolivia; p. 566-574 *In* Ibisch P.L. and G. Mérida (ed.). *Biodiversity: the richness of Bolivia. State of knowledge and conservation*. Ministry of Sustainable Development. Santa Cruz de la Sierra: Editorial FAN.

Schaefer, S.A. 1996. *Nannoptopoma*, a new genus of loricariid catfishes (Siluriformes: Loricariidae) from the Amazon and Orinoco River basins. *Copeia* 1996(4): 913-926.

Staeck, W. 2003. *Südamerikanische Zwergbuntbarsche – Cichliden-Lexikon, Teil 3*. Ettlingen: Dähne Verlag. 219 p.

Zarske, A. and J. Géry. 2001. Beschreibung von drei neuen Arten der Gattung *Characidium* Reinhardt, 1866 aus Bolivien und Paraguay (Teleostei: Characiformes: Characidiidae). *Zoologische Abhandlungen (Dresden)* 51(16): 229-246.

Zarske, A. and J. Géry. 2006. *Knodus longus* sp. n. – ein neuer Salmler (Teleostei: Characiformes: Characidae) aus den bolivianischen Anden, Einzugsgebiet des río Beni. *Zoologische Abhandlungen (Dresden)* 55: 51-57.

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